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INLAND FISHERIES DIVISION MONITORING AND MANAGEMENT PROGRAM

2011 Survey Report

JB Thomas Reservoir

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SURVEY AND MANAGEMENT SUMMARY

Fish populations in J.B. Thomas Reservoir were surveyed in 2011 using electrofishing. Trap net surveys in 2011 and gill net surveys in 2012 were not conducted due to continued dropping lake levels and inability to launch a survey boat. This report summarizes the results of the electrofishing survey and contains a management plan for the reservoir based on those findings.

- **Reservoir Description:** J.B. Thomas Reservoir is a 7,820-acre impoundment (constructed in 1952) on the main stream of the Colorado River. The dam is located 16 miles southwest of Snyder and west of State Highway 208, in Scurry County, Texas. The reservoir is owned by the Colorado River Municipal Water District and provides water to three member cities. The reservoir has a drainage area of 3,950 square miles; however, it experiences frequent water level fluctuations. The reservoir has declined steadily from approximately 3,917 acres in 2005 to 473 acres in 2012 due to drought and municipal water pumping. Angler access is good as most of the shoreline is accessible; however, there is currently no useable boat ramp. At the time of sampling, habitat consisted primarily of sand/silt and rocky shore.

- **Management History:** Important sport fish include largemouth bass, white crappie, and catfish. The sport fish populations have only been managed with statewide regulations.

- **Fish Community**
  - **Prey species:** Catch rates for gizzard shad in the reservoir have declined from 399.5 fish/hour in 2007 to 114.0 fish/h in 2011. Although the Index of Vulnerability has also declined from 98 to 80, most shad were still available as prey to predators. Electrofishing catch of bluegills declined from 52.0 fish/h in 2007 to 24.0 fish/h in 2011, but it was up from 14.0 fish/h in 2003. No bluegill over 5-inches in length were collected.

  - **Catfishes:** Due to low lake levels, catfish populations were not surveyed in 2012.

  - **White bass:** Due to low lake levels, white bass populations were not surveyed in 2012.

  - **Largemouth bass:** Electrofishing catch rates for largemouth bass increased from 27.0 fish/h in 2007 to 63.0 fish/h in 2011. Body condition was good; however, low lake levels and loss of habitat may have limited reproduction as indicated by no juvenile fish being collected during the survey.

  - **White crappie:** Catch rates from a special project conducted by Texas Parks and Wildlife's Heart of the Hills Fisheries Science Center in September 2010 indicate that white crappie were very abundant, but few fish sampled were of legal size. Growth was poor and 90% of the fish were below legal size.

- **Management Strategies:** Conduct general monitoring with trap nets, gill nets, and electrofishing in 2015-2016. If lake levels rise to adequate levels allowing a survey by boat, conduct additional surveys to evaluate the effects of drought and low water levels on fish populations.

INTRODUCTION

This document is a summary of fisheries data collected from J.B. Thomas Reservoir in 2011. The purpose of the document is to provide fisheries information and make management recommendations to protect and improve the sport fishery. While information on other species of fishes was collected, this report deals primarily with major sport fishes and important prey species. Historical data is presented for comparison.

Reservoir Description

J.B. Thomas Reservoir is a 7,820-acre impoundment constructed in 1952 on the main stream of the Colorado River. The dam is located 16 miles southwest of Snyder and west of State Highway 208, in Scurry County, Texas. The reservoir is owned by the Colorado River Municipal Water District (CRMWD) and provides water to three member cities. The reservoir has a drainage area of 3,950 square miles; however, it experiences frequent water level fluctuations. At conservation pool the lake is approximately 2,253 feet above mean sea level (MSL), but an average of quarterly water level data has shown that the lake has averaged less than 2,221.3 feet MSL since 1987 (Figure 1). The reservoir has declined from approximately 3,917 acres in 2005 to 473 acres in 2012 due to drought and municipal water pumping. Capacity during sampling (2,206 feet MSL) was less than 2% of conservation pool. J.B. Thomas Reservoir was mesotrophic with a mean TSI chl-*a* of 51.1 (Texas Commission on Environmental Quality 2011). Habitat consisted of predominantly sand/silt and rocky shoreline with no observable vegetation (Table 1). Angler access is good as most of the shoreline is accessible; however, no boat ramps are currently unusable due to low water (Table 2). Other descriptive characteristics for J.B. Thomas Reservoir are in Table 3.

Management History

Previous management strategies and actions: Management strategies and actions from the previous survey report (Munger 2008) included:

1. Investigate the potential for a regulation change designed to allow harvest of smaller blue catfish and possibly increase growth rates.
   Action: The regulation change was discussed with regional biologists and determined unnecessary at this time.
2. Investigate the potential for a regulation change to remove length and bag limits for crappie in J.B. Thomas Reservoir.
   Action: The regulation change was discussed with regional biologists and determined unnecessary at this time.

Harvest regulation history: Sport fishes in J.B. Thomas Reservoir are currently managed with statewide regulations (Table 4).

Stocking history: J.B. Thomas Reservoir has been stocked with blue catfish, walleye, Florida largemouth bass, and northern largemouth bass. The complete stocking history is in Table 5.

Vegetation/habitat history: A habitat survey was conducted in August 2011. Predominant shoreline habitat in the reservoir was classified as sand/silt shoreline followed by rocky shoreline. No aquatic vegetation was observed in the reservoir.

Water Transfers: CRMWD currently provides water from J.B. Thomas Reservoir to approximately 10,000 people in the city of Snyder in Scurry County, Texas. Without significant rainfall CRMWD anticipated they would no longer be able to pump from J.B. Thomas Reservoir by June 2012. In April 2012, a pipeline allowing water to be pumped to the city from Lake O.H. Ivie was completed.

METHODS

Fishes were collected by electrofishing (0.7 hours at 10 5-min stations); gill netting and trap netting were not conducted due to extreme low water levels and inability to launch a survey boat. White crappie were collected in September 2010 by hoop net, tandem trap nets, and high frequency electrofishing as part of a special research project conducted by Texas Parks and Wildlife's Heart of the Hills Fisheries Science Center, with data used for age and growth information. Catch per unit effort (CPUE) for electrofishing was recorded as the number of fish caught per hour (fish/h) of actual electrofishing. All survey sites were randomly selected and all surveys were conducted according to the Fishery Assessment Procedures (TPWD, Inland Fisheries Division, unpublished manual revised 2011); however, due to low lake levels only 10 of the 12 survey sites were able to be sampled. Habitat and Angler Access surveys were also conducted according to TPWD procedures manuals.

Sampling statistics (CPUE for various length categories), structural indices [Proportional Size Density (PSD)] as defined by Guy *et al*. (2007), and condition indices [relative weight (W_r)] were calculated for target fishes according to Anderson and Neumann (1996). Index of vulnerability (IOV) was calculated for gizzard shad (DiCenzo *et al*. 1996). Relative standard error (RSE = 100 X SE of the estimate/estimate) was calculated for all CPUE statistics and SE was calculated for structural indices and IOV. Otoliths were used to age 601 white crappie. Source for water level data was the United States Geological Survey web site (http://waterdata.usgs.gov/nwis/nwisman/?site_no=08118000).

RESULTS AND DISCUSSION

Habitat: A habitat survey was conducted in August 2011. Primary shoreline habitat in the reservoir was sand/silt shoreline followed by rocky shoreline (Table 1). No aquatic vegetation was observed in the reservoir.

Prey species: Electrofishing catch rates of gizzard shad and bluegill in 2011 were 114.0/h and 24.0/h, respectively. Index of vulnerability (IOV) for gizzard shad was high, indicating 80% of gizzard shad were available to predators; this was lower than IOV estimates in previous years (Figure 2). Total CPUE of gizzard shad in 2011 was much lower than catch rates in 2003 and 2007 surveys (Figure 2). Total CPUE of bluegill in 2011 was lower than total CPUE from surveys in 2007 but higher than in 2003 (Figure 3).

Catfishes: No fish were collected by gill netting due to extreme low water levels preventing sampling.

White bass: No fish were collected by gill netting due to extreme low water levels preventing sampling.

Largemouth bass: The electrofishing catch rate of largemouth bass was 63.0/h in 2011 and was higher than catch rates in 2007 (27.0/h) and 2003 (20.0/h) (Figure 4). No fish less than 15 inches in length were sampled. This is most likely attributed to repeated years of lowering lake levels caused by drought and municipal water pumping resulting in continuous loss of vital spawning habitat. Body condition in 2011 was good as most size classes had W_r near or above 100 (Figure 4).

White crappie: No fish were collected during the 2011 trap net sampling due to extreme low water levels. White crappie were collected by Texas Parks and Wildlife's Heart of the Hills Fisheries Science Center in September 2010 to evaluate age and growth. Data collected indicated that growth was poor (Figure 5). Out of 601white crappie that were aged, 541 were below the 10-inch minimum length limit. Some white crappie reached legal size by age 3, but the majority of fish age 3+ were below 10 inches.

Fisheries management plan for J.B. Thomas Reservoir, Texas

Prepared – July 2012.

ISSUE 1: Extreme drought and municipal water pumping have lowered the lake levels to the point that boater access is no longer available. Survey boats could not be launched to conduct the 2011 trap net or 2012 gill net surveys.

MANAGEMENT STRATEGY

1. If lake levels increase enough to allow boat access, conduct additional surveys to evaluate the effects of extended drought and loss of habitat on the fish populations in the reservoir.

ISSUE 2: Due to the soil types, agricultural land uses, and the nature of infrequent, heavy downpour, rain events that occur in West Texas; Lake J.B. Thomas has experienced a high degree of siltation since its construction in 1952. The dry West Texas conditions also result in a high frequency of water level fluctuations from year-to-year. The combination of all these conditions makes the lake relatively unsuitable for most aquatic vegetation species. As a result, most West Texas reservoirs rely on flooded terrestrial vegetation to serve as aquatic habitat.

Habitat evaluation and enhancement is typically conducted when the habitat area is flooded which makes accurate surveys difficult and enhancement efforts more expensive and difficult. Current extreme low water conditions provide the opportunity to evaluate existing habitat with the potential for lower cost enhancement activities.

MANABEMENT STRATEGY

1. Evaluate the exposed reservoir basin for potential habitat enhancement projects.
2. If enhancement possibilities are identified, coordinate potential action with the controlling authority.

ISSUE 3: Many invasive species threaten aquatic habitats and organisms in Texas and can adversely affect the state ecologically, environmentally, and economically. For example, zebra mussels (Dreissena polymorpha) can multiply rapidly and attach themselves to any available hard structure, restricting water flow in pipes, fouling swimming beaches and plugging engine cooling systems. The financial costs of controlling and/or eradicating these types of invasive species are significant. Additionally, the potential for invasive species to spread to other river drainages and reservoirs via watercraft and other means is a serious threat to all public waters of the state. Current low water conditions and high chlorides have reduced the risk of infestation, but inflows could return the reservoir to high risk.

MANAGEMENT STRATEGIES

1. Cooperate with the controlling authority to post appropriate signage at access points around the reservoir.
2. Contact and educate marina owners about invasive species, and provide them with posters, literature, etc… so that they can in turn educate their customers.
3. Educate the public about invasive species through the use of media and the internet.
4. Make a speaking point about invasive species when presenting to constituent and user groups.
5. Keep track of (i.e., map) existing and future inter-basin water transfers to facilitate potential invasive species responses.

SAMPLING SCHEDULE JUSTIFICATION:

The proposed sampling schedule includes mandatory monitoring in 2015-2016, and if lake levels increase enough to allow boat access, conduct additional surveys in 2013-2014 to evaluate the effects of the extended low water levels on the fish populations (Table 6).

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Anderson, R. O., and R. M. Neumann. 1996. Length, weight, and associated structural indices. Pages 447-482 in B. R. Murphy and D. W. Willis, editors. Fisheries techniques, 2nd edition. American Fisheries Society, Bethesda, Maryland.

DiCenzo, V. J., M. J. Maceina, and M. R. Stimert. 1996. Relations between reservoir trophic state and gizzard shad population characteristics in Alabama reservoirs. North American Journal of Fisheries Management 16:888-895.

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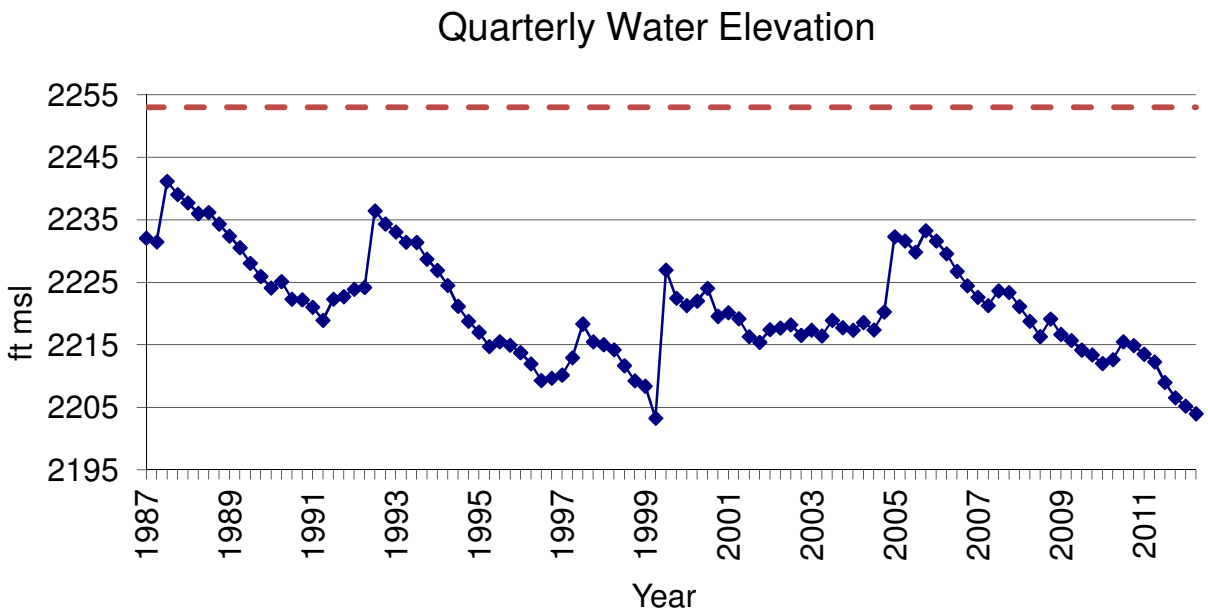


Figure 1. Quarterly water level elevations in feet above mean sea level (MSL) recorded for J.B. Thomas Reservoir, Texas. Conservation pool elevation at 2,253 feet MSL is represented by the dashed line.

Table 1. Habitat survey summary for J.B. Thomas Reservoir, Texas. Data were collected in August, 2011.

Habitat	Miles	Percent (miles)	Acres	Percent (acres)
Natural shore	8.4	85.7		
Rock shore	1.4	14.3		
Open water			1,078.8	100
Total	9.8	100	1,078.8	100

Table 2. Angler access facilities at J.B. Thomas Reservoir, Texas. Data were collected in August, 2011.

Facility	Location	Lanes	Parking capacity	Facilities for physically challenged	Current status
Boat ramp	Campground	1	10	No	Out of water, no access

Table 3. Characteristics of J.B. Thomas Reservoir, Texas.

Characteristic	Description
Year constructed	1952
Controlling authority	Colorado River Municipal Water District
County	Scurry
Reservoir type	Main stream
Shoreline Development Index (SDI)	6.05
Conductivity	2,936 µmhos/cm

Table 4. Harvest regulations for J.B. Thomas Reservoir.

Species	Bag Limit	Minimum-Maximum Length (inches)
Catfish: channel and blue catfish, their hybrids and subspecies	25 (in any combination)	12 - No Limit
Catfish, flathead	5	18 - No Limit
Bass: largemouth	5	14 - No Limit
Crappie: white and black crappie, their hybrids and subspecies	25 (in any combination)	10 - No Limit

Table 5. Stocking history of J.B. Thomas Reservoir, Texas. Size categories are fry (FRY), fingerlings (FGL), and unknown (UNK). Average total length (TL; mm) of each species stocked is given by size category and year.

Species	Year	Number	Life Stage	Length (mm)
Blue catfish	1980	32,928	UNK	UNK
Florida largemouth bass	1980	70,088	FGL	25 - 102
	1999	151,019	FGL	25 - 102
	2004	194,986	FGL	25 - 102
	Total	416,093		
Largemouth bass	1965	20,000	UNK	UNK
	1966	220,000	UNK	UNK
	1968	88,000	UNK	UNK
	1970	40,510	UNK	UNK
	1976	15,000	UNK	UNK
	Total	383,510		
Walleye	1969	500,000	FRY	UNK
	1970	1,350,000	FRY	UNK
	1972	600,000	FRY	UNK
	1973	300,000	FRY	UNK
	Total	2,750,000		

Gizzard Shad

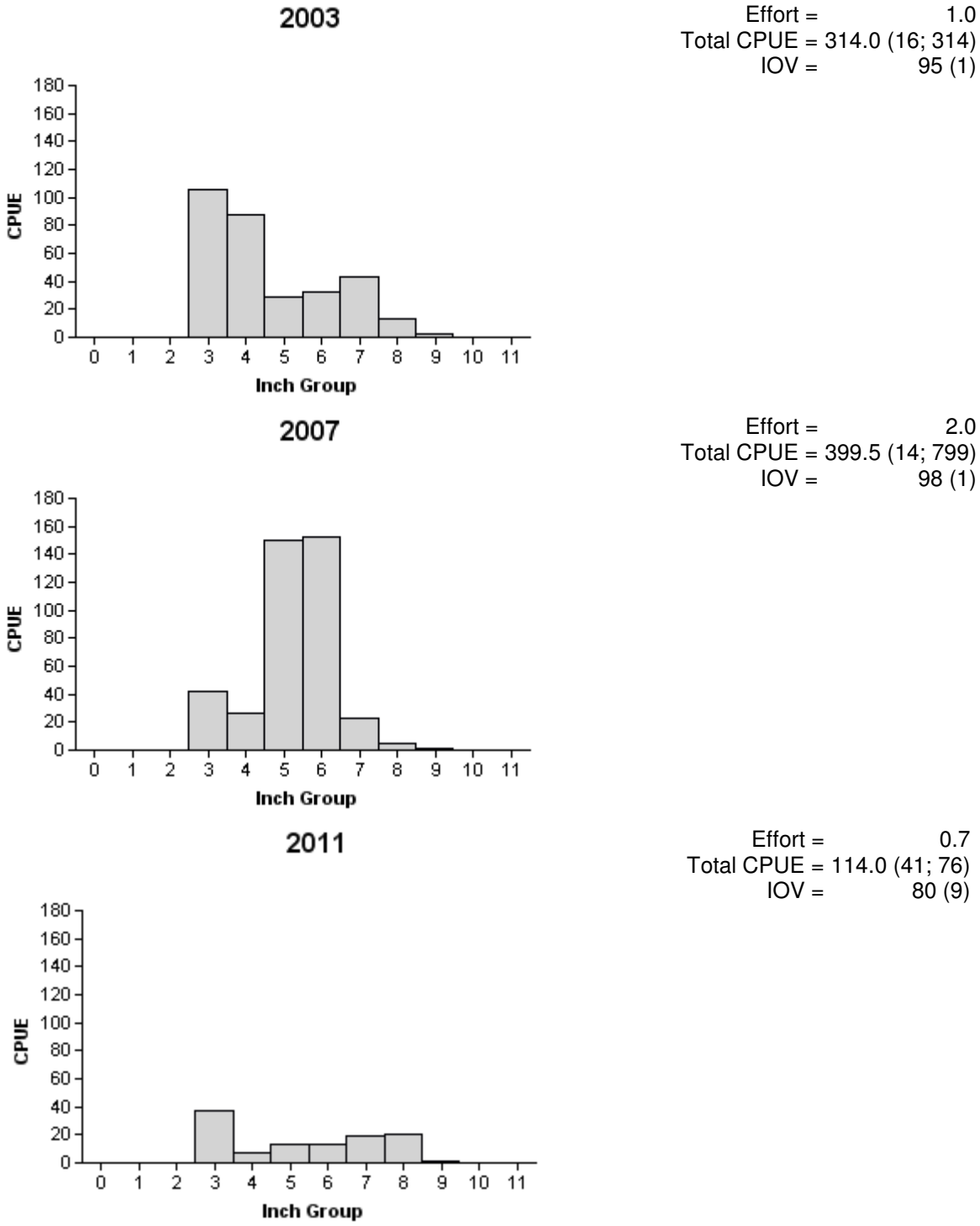


Figure 2. Number of gizzard shad caught per hour (CPUE) and population indices for fall electrofishing surveys, J.B. Thomas Reservoir, Texas, 2003, 2007 and 2011. RSE is used for CPUE values and SE is used for PSD and IOV values.

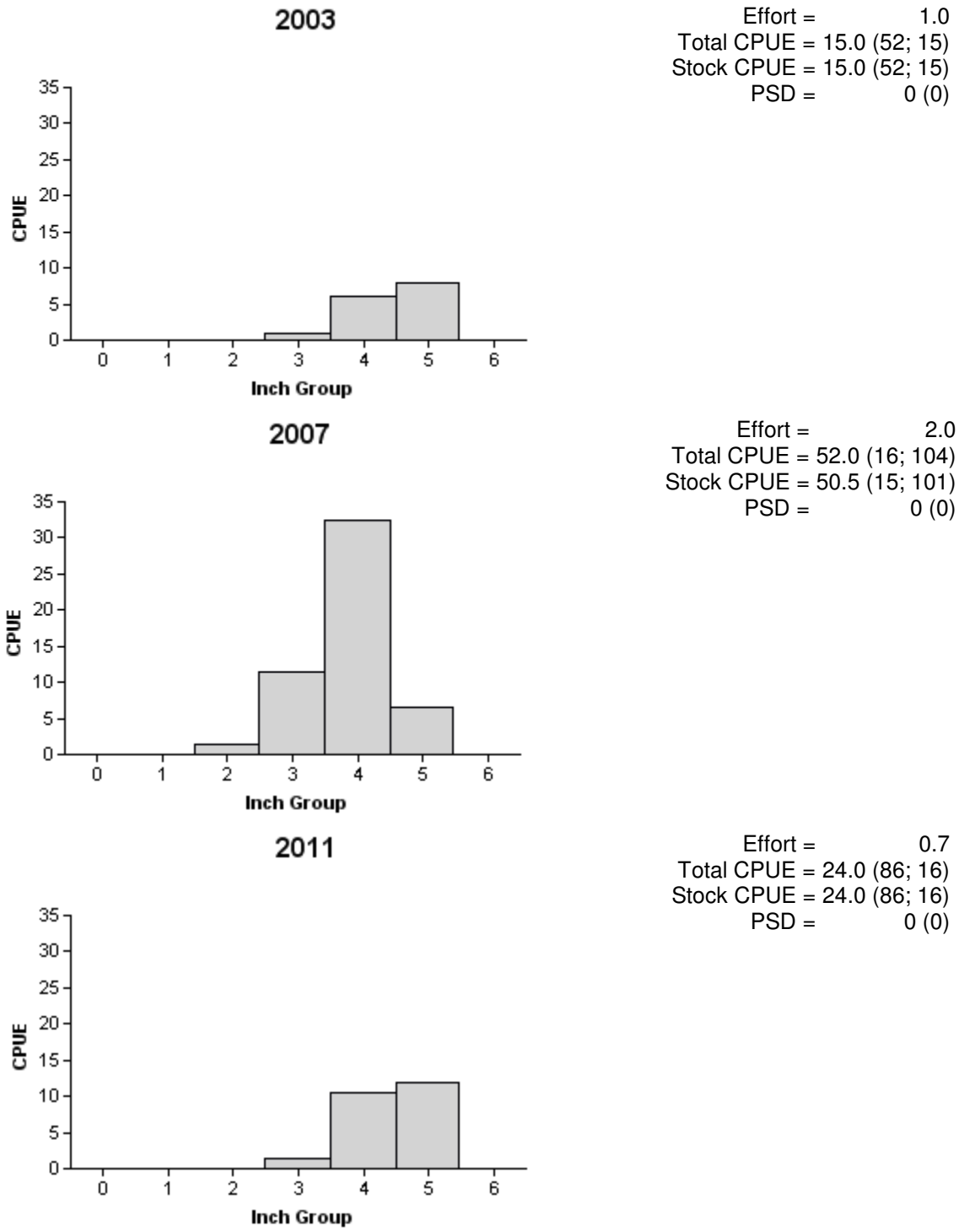


Figure 3. Number of bluegill caught per hour (CPUE) and population indices (RSE or SE and N are in parentheses) for fall electrofishing surveys, J.B. Thomas Reservoir, Texas, 2003, 2007, and 2011. RSE is used for CPUE values and SE is used for PSD.

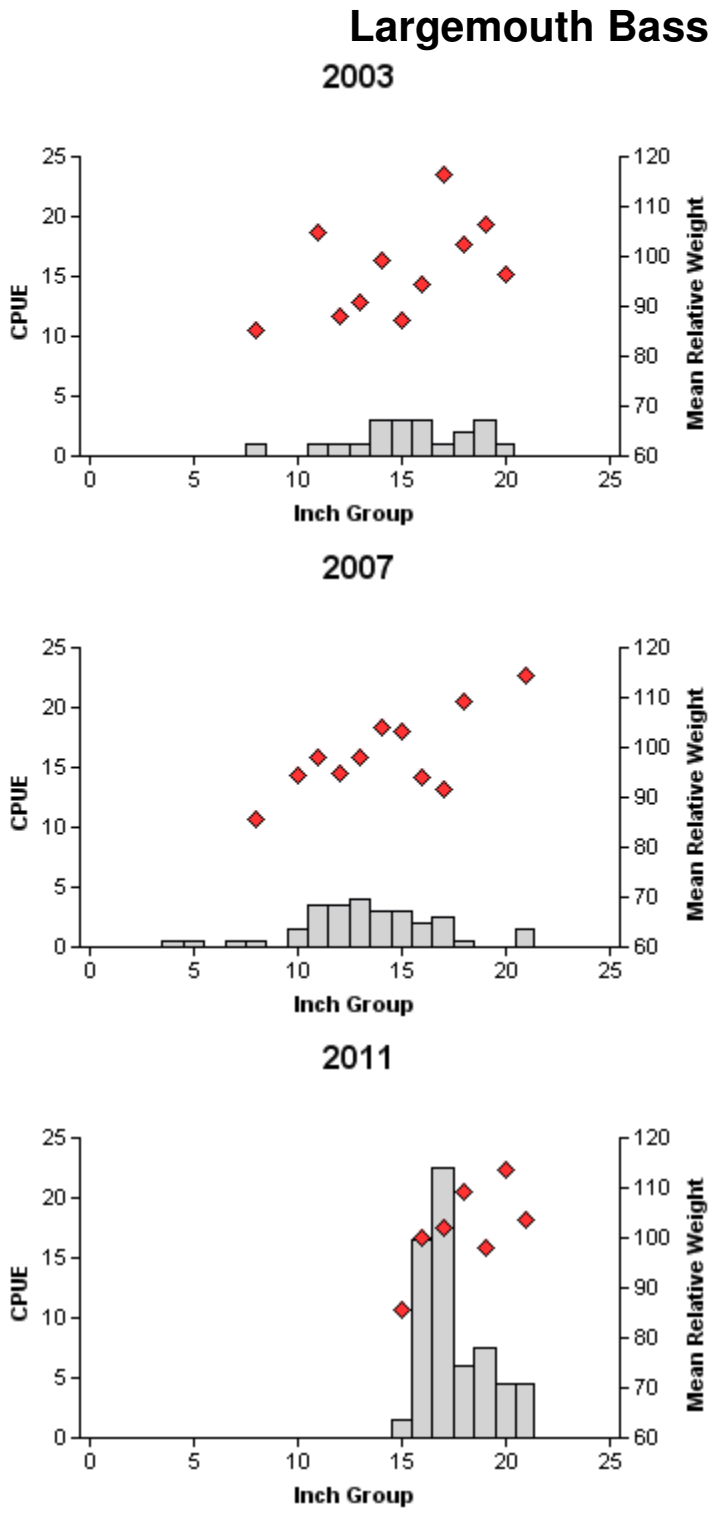


Figure 4. Number of largemouth bass caught per hour (CPUE, bars), mean relative weight (diamonds), and population indices (RSE or SE and N are in parentheses) for fall electrofishing surveys, J.B. Thomas Reservoir, Texas, 2003, 2007, and 2011. RSE is used for CPUE values and SE is used for PSD.

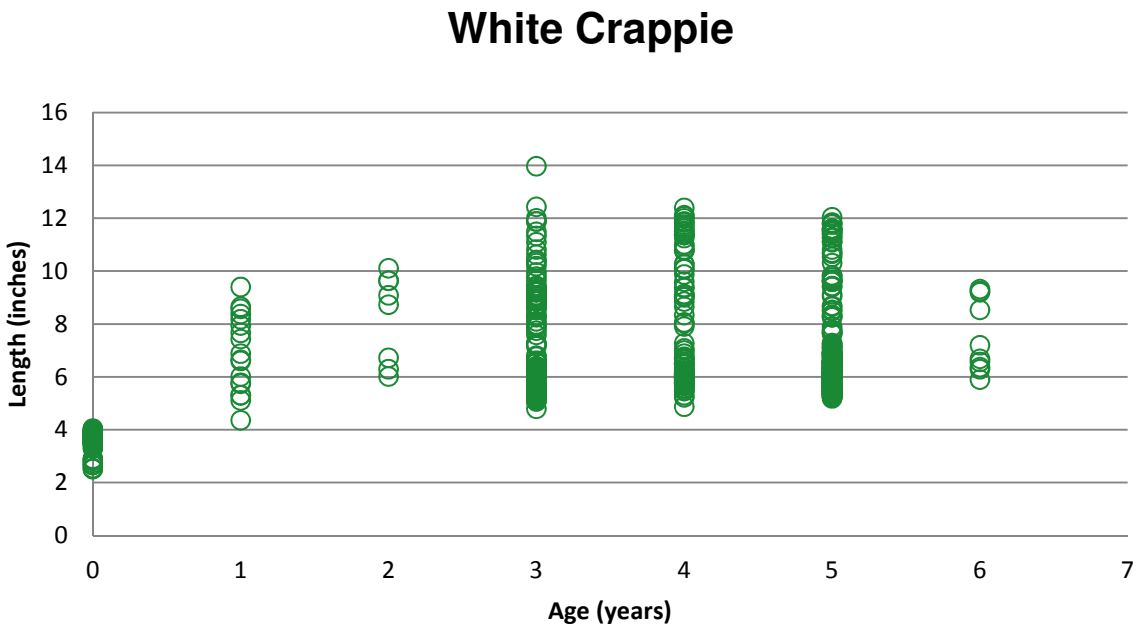


Figure 5. Length at age for 601 white crappie collected by tandem trap nets, electrofishing, and hoop nets at J.B. Thomas Reservoir, Texas, September 2010.

Table 6. Proposed sampling schedule for J.B. Thomas Reservoir, Texas. Gill netting surveys are conducted in the spring, while electrofishing and trap netting surveys are conducted in the fall. Standard survey denoted by S and additional survey denoted by A.

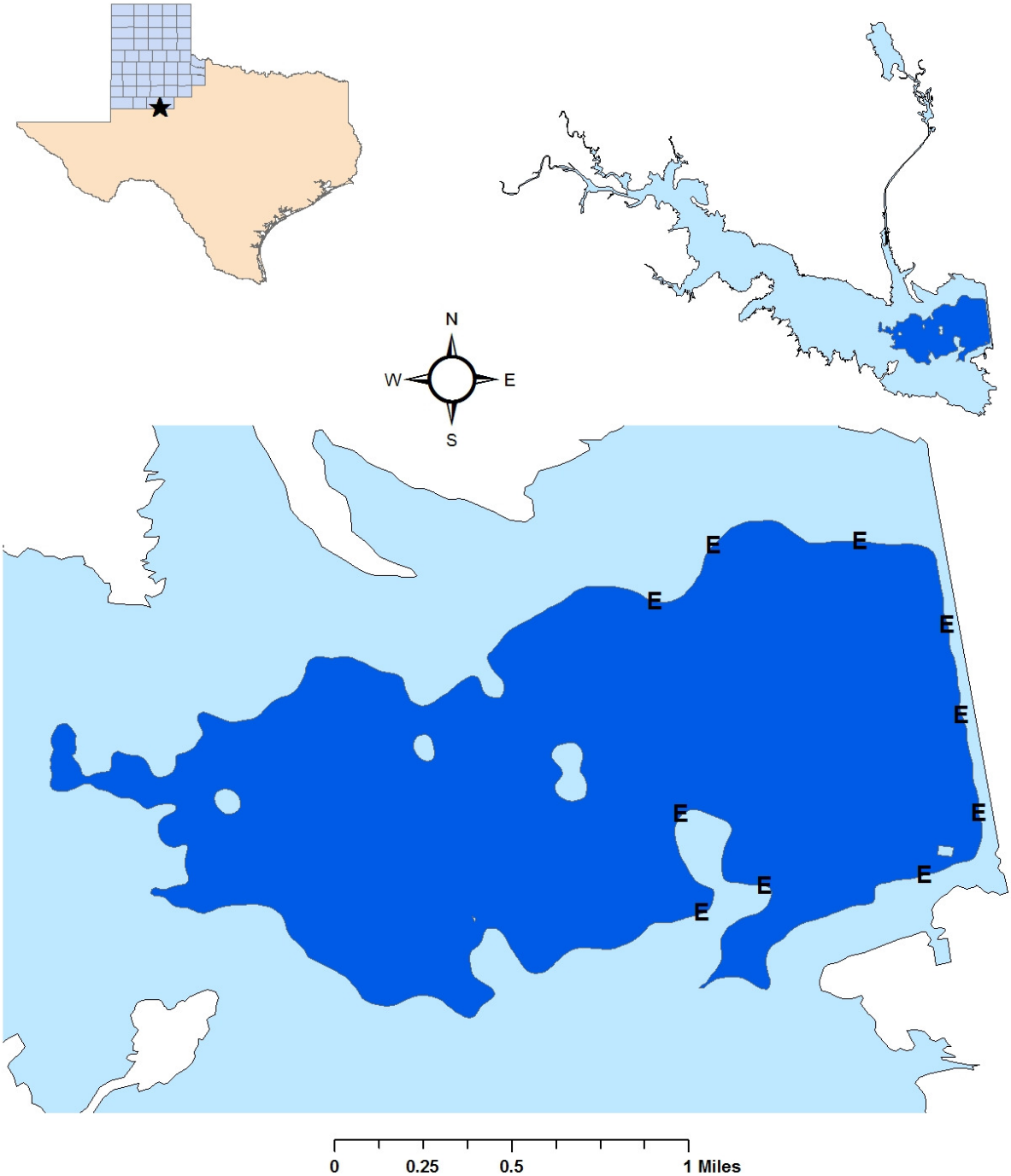
Survey Year	Electrofisher	Trap Net	Gill Net	Habitat Survey	Access Survey	Creel Survey	Report
Fall 2012-Spring 2013							
Fall 2013-Spring 2014	A	A	A				
Fall 2014-Spring 2015							
Fall 2015-Spring 2016	S	S	S	S	S		S

APPENDIX A

Number (N) and catch rate (CPUE) of all species collected from electrofishing from J.B. Thomas Reservoir, Texas, 2011-2012. Sampling effort was 0.7 hours for electrofishing. Extreme low water levels and inability to launch a boat from the boat ramp or shore prevented any sampling by trap net or gill net.

Species	Gill Netting		Trap Netting		Electrofishing	
	N	CPUE	N	CPUE	N	CPUE
Gizzard shad					76	114.0
Common carp					56	84.0
Channel catfish					17	25.5
White bass					10	15.0
Green sunfish					2	3.0
Bluegill					16	24.0
Largemouth bass					42	63.0
White crappie					15	22.5
Freshwater drum					6	9.0

APPENDIX B



Location of electrofishing sampling sites, J.B. Thomas Reservoir, Texas, 2011. Electrofishing stations are indicated by an E. The light blue color represent conservation pool (2,253 feet above mean sea level) of the reservoir and the dark blue represents the lake level (2,206 feet above mean sea level) at the time of sampling.